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Dispensing device for drinks

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## DESCRIPTION

The invention relates to a dispensing device for drinks or similar dosable liquid foodstuffs, in particular for coffee, milk, soft drinks or soups.

15   Dispensing devices of the kind described above are known in diverse forms. In particular in self-service restaurants or canteens, the customers can collect their drinks or soups from the "automat" themselves, by taking a container from the supply cabinet, placing it under a filling outlet, and then actuating  
20   a button that identifies the desired drink. However, this procedure involves certain disadvantages, which particularly during especially busy periods such as midday in a highway rest stop, cause considerable delays and unpleasantness for both the customer and the person responsible for the apparatus.

25   For one thing, it often happens that the customer does not begin to think about which drink he really wants until he is standing in front of the dispensing device. Another person who decides more quickly cannot "get around" the hesitant one, because the latter has already placed his cup or glass under  
30   the filling outlet; hence the next customer must simply wait until the hesitant customer has finally reached a decision.

Furthermore, if a customer has chosen the wrong kind of container, e.g. an espresso cup, and now pushes the button for "cappuccino", the inevitable consequence is an "overflow

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catastrophe", which - and this surely hardly requires an explanation - is just as unpleasant for the customer as it is for the manager of the rest stop.

5 The various drinks or soups obtainable from a dispensing device can be represented to only a limited extent on the switches provided there for choosing among them. In particular, it is very difficult to represent their amounts, e.g. a small cup of espresso as opposed to a "mug" of coffee. The customer who puts a large cup under the outlet and, after activating a button,  
10 finds it filled only with an espresso is disappointed.

Starting from the state of the art as described above, it is the objective of the present invention to disclose a dispensing device for drinks or similar dosable liquid foodstuffs that improves and facilitates usability in a simple manner.

15 This objective is achieved by a dispensing device for drinks or similar dosable liquid foodstuffs, in particular for coffee, milk, soft drinks and/or soups, that comprises an identification means to identify the various containers used to receive the foodstuff for subsequent consumption from the same  
20 container, and to send out an identification signal describing that container, as well as a valve mechanism that in response to the identification signal connects at least one of a plurality of supply means for supplying a specified foodstuff or a mixture of specified foodstuffs to a filling mechanism,  
25 and fills the container with a predetermined amount of the specified foodstuff or mixture. The identification means comprises sensors to detect features of the container's shape and/or to measure the weight of the container or a combination thereof.

30 An essential point of the invention resides in the fact the choice of the foodstuff is already made when the container is chosen and removed from the storage cabinet by the customer. Since the container is always filled with the same foodstuff,

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no overflow catastrophe can occur, because not only the nature but also the amount of the foodstuff that is dispensed is determined by the container itself. Furthermore, indecisive customers do not get in the way of others because they cannot  
5 block access to the dispensing device, so impoliteness is eliminated. Because the shape characteristics and/or the weight of the container or a combination of these two measured values is obtained, no separate identification means (for example, barcode strips or the like) need be provided. Hence the manager  
10 of the rest stop can continue to use the containers already available, and need not change them.

Examples of shape characteristics that can be used for identifying the container include the maximal height and maximal width of the container or special configurations, for  
15 instance the different shapes of an espresso cup or a coffee mug. Much the same applies to the weight characteristics of the container. However, the combination of the characteristics "shape" and "weight" is especially advantageous, because it ensures greater reliability of the identification.

20 Finally, it is also very much simpler for the foodstuff to be represented on the container, by a verbal description and a picture, so that the customer receives this information from the chosen container. Then when he places a soup dish in the dispensing device, it cannot happen that he receives milky  
25 coffee instead.

Preferably the identification means comprises a programmable memory in which, for each of the various identification signals, are stored quantity signals and/or choice signals for specification of the corresponding foodstuff. Such memories can  
30 be economically obtained and programmed.

It is particularly preferred for the identification means additionally to comprise a reading means for reading information attached to the container; this reading process can

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be optical (e.g., by way of a barcode) or electromagnetic (e.g., by way of a transponder or magnetic strip). In this case even identically shaped containers with identical weights can be used, which are distinguished for the customer by the pictorial information they bear.

Preferably the identification means is designed to send out a start signal, which frees the valve mechanism for filling the container when the container is oriented in a predetermined position with respect to the filling mechanism. As a result, it can no longer happen that the dispensed drink misses a carelessly positioned container, and this result is achieved with no need for complicated adjustment mechanisms to ensure that the container is correctly positioned.

Preferably a manually actuatable start switch is provided to send out a start signal that allows a filling process to begin. Thus the customer has the feeling that he is still "master of the situation", and is not startled by a sudden beginning of the dispensing process.

The filling mechanism is preferably so constructed that it can simultaneously dispense the foodstuff into two (or even more) containers, in which case the identification means is designed to send out position signals and the filling mechanism is controlled in such a way that it can fill two (or more) containers, depending on how many are present. Hence a stressed-out father collecting the obligatory cola for his three children need no longer organize three filling processes, but instead can complete his task in a single step. The otherwise complicated actuation of various switches on the dispensing device is entirely eliminated.

Preferably the identification means comprises a sensor to detect the state of filling, by way of which it is possible to adjust a maximal level to which the particular container can be filled with the foodstuff. In this way it is ensured that any

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attempt to put an excessive amount of the desired drink into an unsuitable container is prevented. As a result, the manager of the establishment cannot be cheated, and furthermore an overflow catastrophe is ruled out, as is the likelihood that  
5 the drink will slop over during the subsequent transport.

Preferably a learning means is provided, with a manually actuatable controller for dispensing the foodstuff into a container and storing in memory the amounts dispensed and/or data regarding the state of filling in dependence on an  
10 identification signal. Thus the manager is not confined to particular containers provided by the manufacturer of the dispensing device, but instead can work with his own supply of dishes and adjust the dispensing device to the dishes with respect to the amounts of foodstuffs to be put into them.  
15 Preferably a (where appropriate, an additional) learning means is provided for inputting specification data for a specified foodstuff in dependence on an identification signal, so that the manager merely places the container intended for use with a particular foodstuff into the dispensing device, in the same  
20 way as a customer does, and selects or programs in the corresponding foodstuff. The learning means (or an additional learning means) is preferably furthermore designed so that various containers can be presented consecutively to the sensor arrangement, for detection of the shape characteristics, and/or  
25 to the weight-measuring means, so that the shape-characteristic/weight combination associated with a particular container can be specified. Then, for example, an "identification code" can be assigned to each container, which (likewise by way of the learning means) can be linked to a  
30 particular specification regarding filling amount and kind of drink. Thus when desired, it is possible quite simply to assign the same contents to different types of container in the establishment's collection, for instance because it has become impossible to obtain replacements for a particular type.

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Another advantage derives from the means of detecting shape/weight in accordance with the invention, inasmuch as a given set of sensors can be used for various purposes. Firstly, the sensors can determine the correct position of the container during filling, secondly they can measure the state of filling, and thirdly they can identify the type of container.

In the following the invention is explained in greater detail with reference to drawings, wherein

- 10       - Figure 1 is a schematic drawing of an embodiment of the dispensing device in accordance with the invention, and
- Figure 2 is a section of Figure 1 with a filling mechanism modified for the simultaneous filling of several containers.

15   In the following description, the same reference numerals are used for identical parts or parts with identical actions.

Figure 1 shows a dispensing device in which a container 1 is standing on a weighing scale 12 positioned below a filling mechanism 25 such that a foodstuff flowing out of the filling mechanism 25 will enter the container. The scale 12 is connected to an identification means 10 to which it signals the measured weight; in addition to the weight signal, the identification means 10 also receives output signals from an optical identification device 13, e.g. a camera, a code reader 14 and a filling-state sensor 15. The camera 13 can be used in such a way that in the identification means 10 the position of the container 1 is specified simultaneously with its shape characteristics, to ensure that the foodstuff emerging from the filling mechanism 25 actually enters the container 1. When the identification means 10 determines, on the basis of the sensor signals it receives, which container is standing under the filling mechanism 25 and whether the container is also

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correctly positioned, it generates a release signal for valve mechanism 20, which by way of individual valves 21, 22 and 23 with supply means 30, 31 and 32 are connected upstream and downstream to the filling mechanism 25. This release signal is  
5 blocked, however, until the customer actuates a start switch 17. It is only after this start signal has been given that the container 1 is filled by the filling mechanism 25.

Furthermore, a memory 11 is connected to the identification means 10 in such a way that in response to the identification  
10 signals, which are derived from the signals sent out by the sensors 12 to 14, a selection of the foodstuff associated with the container that has been presented is made, and the amount of foodstuff is specified. If, for example, the supply means 30 delivers espresso and the supply means 31 delivers milk,  
15 depending on which particular container 1 has been chosen either only espresso will be dispensed or a mixture of espresso and milk, the latter for a cappuccino or a latte macchiato. This decision is made in the identification means 10 on the basis of the data stored in the memory 11.

20 In the embodiment of the invention shown in Figure 1 a learning means 35 with a keyboard 37 is also provided, which in addition comprises a switch 30 (which of course can also be disposed in the keyboard 37). By means of this learning means 35 the manager can place a container 1, which has been specially  
25 selected by the manager but otherwise has not been characterized in any particular way, into the dispensing device as a customer would, but assign to the identification signals generated in the identification means 10 certain kinds of information, in particular the nature and amount of the  
30 foodstuff that is to be dispensed. During this procedure he can use the switch 36 to control the valve mechanism 20 so that the the amount of foodstuff he has specified is put into the container. He can also prespecify a maximal amount, which is sensed by the filling-state sensor 15.

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In Figure 2 is shown a dispensing device with a filling mechanism 25 constructed for simultaneous dispensing into two (identical) containers 1 and 1'. The previously described sensors in Figure 1, in particular the optical detection device 5 13, are also provided here, so that in response to an corresponding identification signal the identification means 10 actuates both outlets of the filling mechanism 25 when two containers have been placed below them, and actuates only one outlet (the correct one, of course) when only a single 10 container is positioned under the filling mechanism 25.

It will be evident from the above that the invention can also be employed when a coffee machine provided with the necessary technical devices is operated in the manner in accordance with the invention. The invention thus also comprises a particular 15 method for the operation of a dispensing device.



List of reference numerals

	1	Container
	10	Identification means
	11	Memory
5	12	Weighing scale
	13	Camera
	14	Code reader
	15	Filling-state sensor
	17	Start switch
10	20	Valve mechanism
	21	1st valve
	22	2nd valve
	23	3rd valve
	25	Filling mechanism
15	30	Supply means
	31	Supply means
	32	Supply means
	35	Learning means
	36	Switch
20	37	Keyboard